

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appl. No. : 10/529,919 Confirmation No. 5284  
Applicant (s) : S. Yalvac et al.  
Filed : April 1, 2005  
TC/A.U. : 1796  
Examiner : J. S. Lenihan  
Title : POLYMER COMPOSITIONS COMPRISING A LOW-  
VISCOSITY, HOMOGENEOUSLY BRANCHED  
: ETHYLENE/ $\alpha$ -OLEFIN EXTENDER  
  
Docket No. : 60285A  
Customer No. : 00109

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**AMENDMENT**

In response to the Office Action dated May 6, 2010, please amend the above-identified application as follows.

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Remarks/Arguments** begin on page 6 of this paper.

**Amendment to the Claims:**

Please amend the claims as follows:

Claim 1 (Currently Amended): A thermoplastic blend composition consisting of:

A) from 75 to 99 weight percent, based on the total weight of the thermoplastic blend composition, of a thermoplastic polyolefin composition, which comprises the following:

(a) from 50 to 100 weight percent of polypropylene, HDPE, or a mixture thereof; and

(b) from 0 to 50 weight percent of a first ethylene/ $\alpha$ -olefin interpolymers having a density from 0.870 to less than, or equal to, 0.9130 g/cm<sup>3</sup>; and

B) from 1 to 25 weight percent, based on the total weight of the thermoplastic blend composition, of an extender, comprising a second ethylene/ $\alpha$ -olefin interpolymers, other than component A)(b), and having the following properties: (a) a density of at least 0.855, and less than, or equal to, 0.8900 g/cm<sup>3</sup> and (b) a Brookfield Viscosity, at 350°F, from ~~500 cP~~ 3000 cP to 50,000 cP, and wherein the second ethylene/ $\alpha$ -olefin interpolymers is a copolymer; and

at least one additive selected from the group consisting of fillers, antioxidants, cling additives, antiblock additives, colorants, pigments, waxes, nucleating agents, extender oils, flame retardants, tackifiers, and combinations thereof, and

wherein the melt index of said thermoplastic blend composition is increased by at least 5 percent, relative to that of said thermoplastic polyolefin composition.

Claim 2 (Previously Presented): The thermoplastic blend composition of Claim 1, wherein Component A) is present in an amount from 80 to 98 weight percent, based on the total weight of the thermoplastic blend composition; and

Component B) is present in an amount from 2 to 20 weight percent, based on the total weight of the thermoplastic blend composition, and wherein the second ethylene/ $\alpha$ -olefin interpolymers has (a) a density of less than 0.8800 g/cm<sup>3</sup>, and (b) a Brookfield Viscosity, at 350°F, of at least 500 cP, but less than 50,000 cP; and

wherein the melt index of said thermoplastic blend composition is increased by at least 10 percent, relative to that of said thermoplastic polyolefin composition.

Claim 3 (Previously Presented): The thermoplastic blend composition of Claim 1, wherein Component A) is present in an amount from 85 to 97 weight percent, based on the total weight of the thermoplastic blend composition; and

Component B) is present in an amount from 2 to 20 weight percent, based on the total weight of the thermoplastic blend composition, and wherein the second ethylene/ $\alpha$ -olefin interpolymers has (a) a density of less than 0.8800 g/cm<sup>3</sup>, and (b) a Brookfield Viscosity, at 350°F, of at least 500 cP, but less than 40,000 cP; and wherein the melt index of said thermoplastic blend composition is increased by at least 15 percent, relative to that of said thermoplastic polyolefin composition.

Claim 4 (Previously Presented): The composition of Claim 1, 2, or 3, wherein the interpolymers of Component B is a substantially linear ethylene/ $\alpha$ -olefin copolymer.

Claim 5 (Previously Presented): The composition of Claim 4, wherein the substantially linear ethylene/ $\alpha$ -olefin copolymer has a density in the range from 0.860 to 0.880 g/cm<sup>3</sup>.

Claim 6 (Previously Presented): A film, fiber, coating, or molded article formed from the composition of Claim 1.

Claim 7 (Canceled)

Claim 8 (Canceled)

Claim 9 (Canceled)

Claim 10 (Previously Presented): The composition of Claim 1, wherein Component B) is present in an amount from 2 to 20 weight percent, based on the total weight of the thermoplastic blend composition.

Claim 11 (Previously Presented): The composition of Claim 1, wherein the second ethylene/ $\alpha$ -olefin interpolymers has a density less than, or equal to, 0.870 g/cm<sup>3</sup>.

Claim 12 (Previously Presented): The composition of Claim 1, wherein Component A) is present in an amount from 80 to 98 weight percent, based on the total weight of the thermoplastic blend composition.

Claim 13 (Previously Presented): The composition of Claim 1, wherein Component A) is present in an amount from 85 to 97 weight percent, based on the total weight of the thermoplastic blend composition.

Claim 14 (Previously Presented): The composition of Claim 1, wherein the second ethylene/ $\alpha$ -olefin interpolymer has a Brookfield Viscosity, at 350°F, from 4,000 cP to 50,000 cP.

Claim 15 (Previously Presented): An article comprising at least one component formed from the composition of Claim 1.

Claim 16 (Canceled)

Claim 17 (Currently Amended): A thermoplastic blend composition consisting of:

A) from 75 to 99 weight percent, based on the total weight of the thermoplastic blend composition, of a thermoplastic polyolefin composition, which consists essentially of the following:

(a) from 50 to 100 weight percent of polypropylene, HDPE or a mixture thereof; and

(b) from 0 to 50 weight percent of a first ethylene/ $\alpha$ -olefin interpolymer having a density from 0.870 to less than, or equal to, 0.9130 g/cc; and

B) from 1 to 25 weight percent, based on the total weight of the thermoplastic blend composition, of an extender consisting essentially of a second ethylene/ $\alpha$ -olefin interpolymer, other than component A)(b), and having the following properties: (a) a density of less than 0.8800 g/cm<sup>3</sup>, and (b) a Brookfield Viscosity, at 350°F, from ~~500~~ 3000 cP to 50,000 cP, and wherein the second ethylene/ $\alpha$ -olefin interpolymer is a copolymer; and

one or more additives selected from the group consisting of antioxidants, cling additives, antiblock additives, colorants, pigments, waxes, nucleating agents, extender oils, flame retardants, tackifiers and combinations thereof; and

wherein the melt index of said thermoplastic blend composition is increased by at least 5 percent relative to that of said thermoplastic polyolefin composition.

Claim 18 (Previously Presented): The composition of Claim 1, wherein Component B) is present in an amount from 3 to 15 weight percent, based on the total weight of the thermoplastic blend composition.

Claim 19 (Previously Presented): An article comprising at least one component formed from the composition of Claim 17.

Claims 20-21 (Canceled)

Claim 22 (Canceled)

Claim 23 (Previously Presented): The composition of Claim 17, wherein Component A) is present in an amount from 85 to 97 weight percent, based on the total weight of the thermoplastic blend composition.

Claim 24 (Previously Presented): The composition of Claim 17, wherein the second ethylene/ $\alpha$ -olefin interpolymer has a density less than, or equal to, 0.870 g/cm<sup>3</sup>.

### **REMARKS/ARGUMENTS**

The present amendment and remarks are in response to the Office Action dated May 6, 2010. Applicants have filed herewith a Request for Continued Examination (RCE), and a three month extension of time. Applicants have also filed herewith a Declaration under 37 C.F.R. § 1.132.

Claims 1-6, 10-15, 17-19, 23 and 24 are active in the present application. Claims 1 and 17 were amended as shown above. Support for these amendments can be found on page 11 of the specification. No new matter is believed to have been introduced by the amended claims.

#### **Claim Rejections under 35 U.S.C. § 103(a)**

The Examiner rejected Claims 1-6, 10-15, 17-19, 23 and 24 under 35 U.S.C. § 103(a), as unpatentable over U.S. Patent 5,861,463 (hereinafter the '463 patent), in view of U.S. Patent 5,278,272 (hereinafter the '272 patent). Applicants respectfully traverse for the following reasons.

The prior art must be considered in its entirety, including disclosures that teach away from the claimed invention (see MPEP 2141.02, section VI). The proposed modification cannot render the prior art unsatisfactory for its intended purpose (see MPEP 2143.01, section V). The art must suggest the desirability of the modification. See also *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984), *[t]he mere fact that the prior art could be so modified would not have made the modification obvious, unless the prior art suggested the desirability of the modification.*

The '463 patent is directed to a thermoplastic composition having at least three phases (see for example, Claim 1; abstract; column 1, lines 45-61; and column 10, lines 56-63). The '463 composition is cost-effective, and has improved or maintained low temperature impact performance and mechanical properties (see column 1, lines 38-43). The '463 patent requires that its homogeneous linear or substantially linear ethylene polymer have a density of at least "0.04 g/cm<sup>3</sup>" higher than the density of its elastomeric impact modifier (see abstract, column 1, lines 55-61, column 2, lines 7-12, and column 7, lines 39-44). Thus, the '463 patent teaches that its homogeneous linear or substantially linear ethylene polymer must have a higher density than its elastomeric impact modifier, and that this density differential must be at least "0.04

g/cm<sup>3</sup>. Moreover, preferably the homogeneous linear or substantially linear ethylene polymer has a density of at least “0.05 g/cm<sup>3</sup>” higher, and more preferably at least “0.06 g/cm<sup>3</sup>” higher, than the density of the elastomeric impact modifier (see column 7, lines 39-42). In this multi phase composition, discrete particles of the homogeneous linear or substantially linear ethylene polymer are dispersed at least in the elastomeric impact modifier, which, in turn, is dispersed, as discrete particles, in the thermoplastic polymer matrix (see, for example, column 10, lines 56-63). One of ordinary skill in the art would recognize that the at least “0.04 g/cm<sup>3</sup>” density differential is required in the ‘463 composition to maintain separate phases of the homogeneous linear or substantially linear ethylene polymer and the elastomeric impact modifier. From the disclosure of the ‘463 patent, one skilled in the art would understand that if this density differential is reduced, the miscibility of these two polymer components would increase, and the impact and mechanical properties of the composition would be impaired. Thus, reducing this density differential would diminish the “three-phase” morphology, and thus render the ‘463 patent unsatisfactory for its intended purpose of providing new cost-effective compositions with improved or maintained low temperature impact performance and mechanical properties. Thus, the ‘463 patent teaches away from compositions, as claimed, in which this density differential is not met. The ‘272 patent does not overcome the deficiencies of the ‘463 patent.

As shown in Applicants’ Claim 1, the lowest density of the first ethylene/ $\alpha$ -olefin interpolpolymer is 0.870 g/cm<sup>3</sup>, and the highest density of the second ethylene/ $\alpha$ -olefin interpolpolymer is 0.8900 g/cm<sup>3</sup>. Thus, for this claim, if the second ethylene/ $\alpha$ -olefin interpolpolymer has a higher density than the first ethylene/ $\alpha$ -olefin interpolpolymer, the maximum density differential is only 0.02 g/cm<sup>3</sup>. Thus, Applicants’ Claim 1 falls outside the requirements of the ‘463 patent that the homogeneous linear or substantially linear ethylene polymer have a higher density than the elastomeric impact modifier, and that this density differential is at least “0.04 g/cm<sup>3</sup>”. The claims dependent from Claim 1 do not broaden the density of this claim.

As shown in Applicants’ Claim 17, the lowest density of the first ethylene/ $\alpha$ -olefin interpolpolymer is 0.870 g/cm<sup>3</sup>, and the highest density of the second ethylene/ $\alpha$ -olefin interpolpolymer is 0.8800 g/cm<sup>3</sup>. Thus, for this claim, if the second ethylene/ $\alpha$ -

olefin interpolymer has a higher density than the first ethylene/ $\alpha$ -olefin interpolymer, the maximum density differential is only  $0.01 \text{ g/cm}^3$ . Thus, Applicants' Claim 17 falls outside the requirements of the '463 patent that the homogeneous linear or substantially linear ethylene polymer have a higher density than the elastomeric impact modifier, and that this density differential is at least " $0.04 \text{ g/cm}^3$ ". The claims dependent from Claim 17 do not broaden the density of this claim.

In addition, as shown in the Declaration from B. Walther, the inventive formulation 6A, had the best balance of melt flow rate and impact resistance of those formulations that can be compounded using a continuous extrusion process. Formulation 6A had a higher melt flow rate than formulations AA, AB, and AC, which contained extenders with higher viscosities. The higher melt flow rate of formulation 6 is preferred to provide an optimized mold fill. It is noted that Extender #7 had melt index ( $0.5 \text{ g/10 min}$ ) similar to the melt indexes of the third phase components ( $0.35 - 0.5 \text{ g/10 min}$ ) of the experimental compositions of the '463 patent, as shown in Table 2 of this patent. Extender #7 was added to formulation AA, and this formulation had a poor balance of melt flow rate and impact resistance. The formulation AD was unacceptable because Extender #10 could not be pelletized, and keep a batch-wise addition to this formulation, instead of a more efficient continuous extrusion process.

For at least the above reasons, the '463 patent, in view of the '272 patent, does not teach or suggest the invention as claimed. Applicants respectfully request the withdrawal of this rejection.



Applicants submit that the present amendment is now in condition for allowance, and request early notice of such action. If further issues remain, Applicants respectfully request that the Examiner call Applicants' undersigned representative.

Respectfully submitted,

**THE DOW CHEMICAL COMPANY**

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